The Cost Estimating Process

Module 2

ESC Cost Core Training
Developed By

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The Cost Estimating Process - Part 2

The Cost Estimating Process

- How Does ACEIT Fit Into the Process?
- Special “Watch Areas” in a Cost Estimate
- How Can You Tell If the Cost Estimating Process Is Healthy and the Estimate Is Good?
- What Makes One Estimate Better Than Another?

How Does ACEIT Fit Into the Cost Estimating Process?

ACEIT: Automated Cost Estimating Integrated Tools

- an integrated framework for estimating development, production, operating and support costs
- powerful, comprehensive and yet user friendly

ACE: The Automated Cost Estimating System

. . . includes 6 Steps of the CE Process

- Define & Plan (build a WBS)
- Specify Estimating Methodology
- Calculate
- Time Phase in Base Year Dollars
- Inflate to Then Year Dollars
- Documentation

Build a WBS

- In addition to specifying your program name, select the major hardware and software systems of your program.
- ACE then displays a complete WBS including elements like training, tests, management and data.
- The definitions of the WBS elements are all contained within ACE.

Specify Estimating Methodology

From the estimating methodology library in ACE, you can access Cost Estimating Relationships (CERs), models and sources that are linked to a particular WBS element.

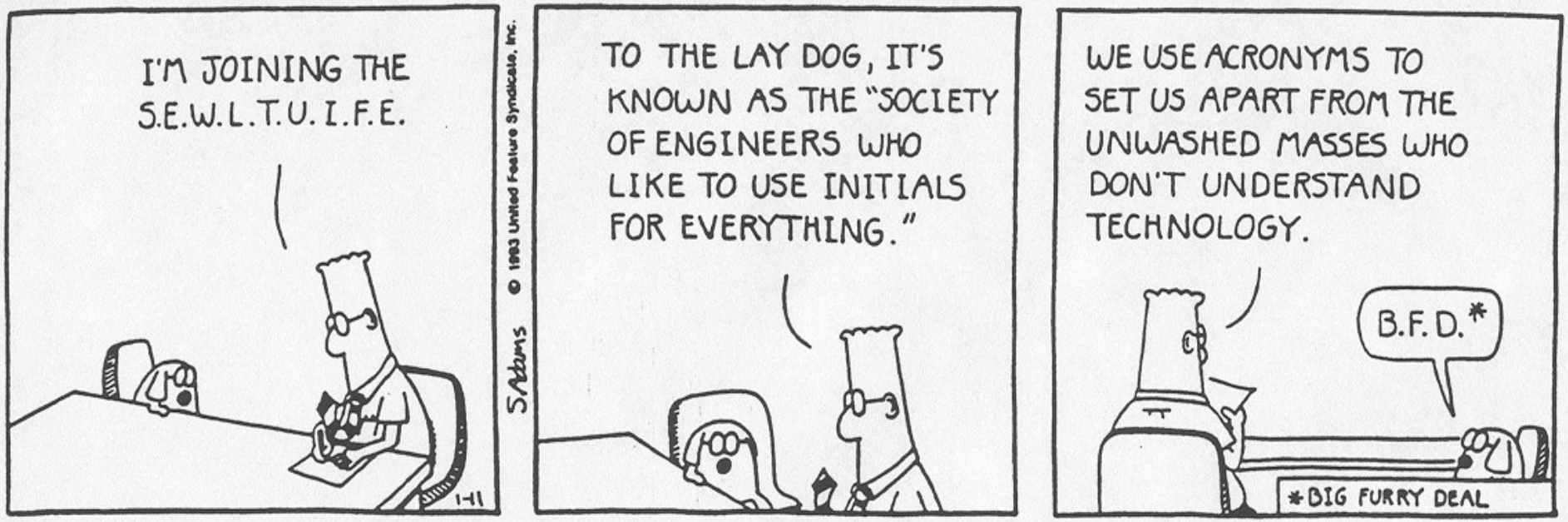
Other ACEIT Tools

ACDB: Automated Cost Database

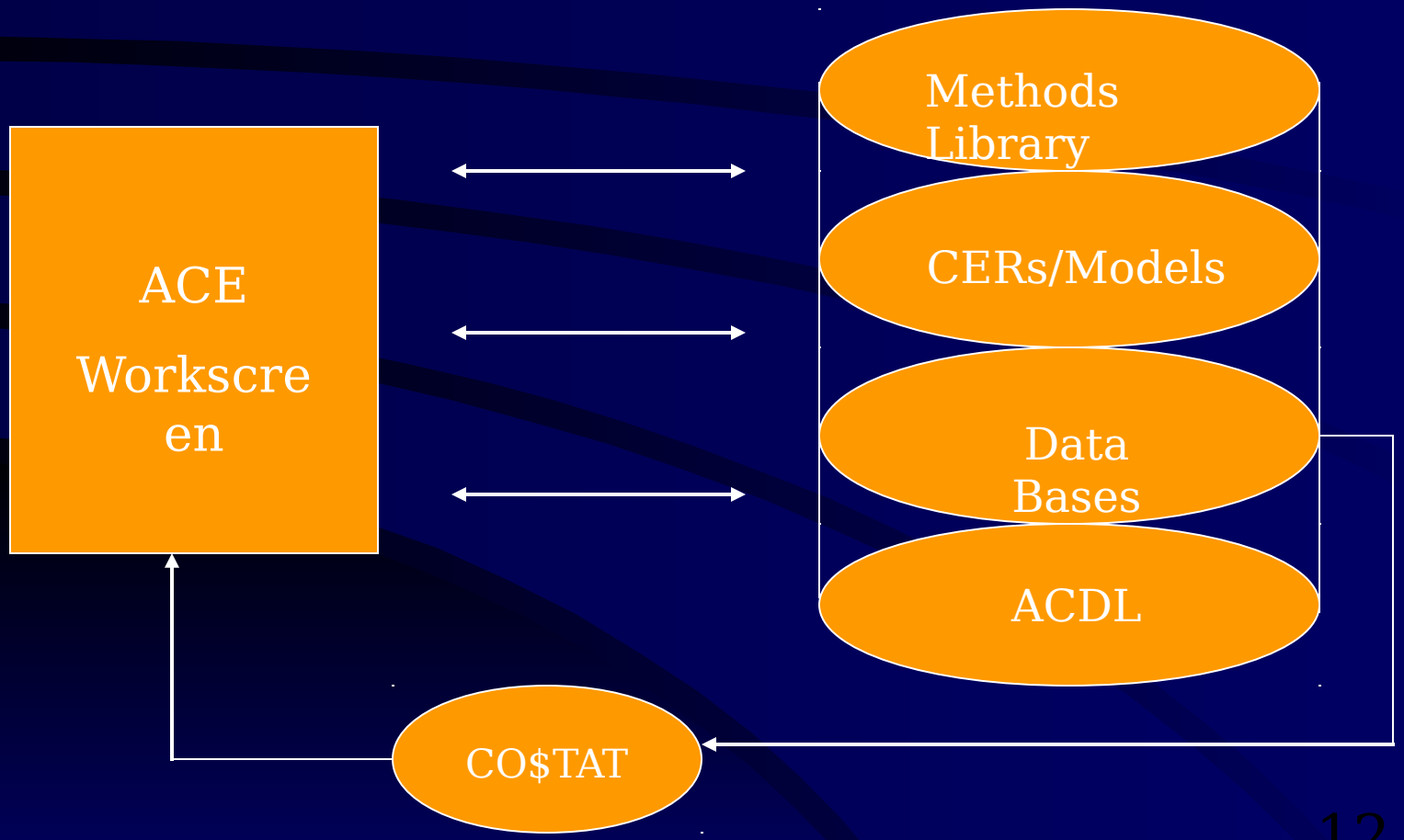
- contains historical cost and schedule data for ESC Programs and analogous programs

CO$TAT

- statistics package in which information from ACDB or other sources can be loaded to create your own CER (equation)


I'M JOINING THE S.E.W.L.T.U.I.F.E.
S Adams © 1993 United Feature Syndicate, Inc.
TO THE LAY DOG, IT'S KNOWN AS THE "SOCIETY OF ENGINEERS WHO LIKE TO USE INITIALS FOR EVERYTHING."
WE USE ACRONYMS TO SET US APART FROM THE UNWASHED MASSES WHO DON'T UNDERSTAND TECHNOLOGY.
B.F.D.*
*BIG FURRY DEAL

The Integrated Tools of ACEIT



Calculate

ACE is programmed to make all necessary inflation adjustments or normalizations.

- Once you specify the Base Year of the estimate, all other cost functions and inputs are automatically normalized to that Base Year.
- The input variables used in your estimate are displayed at the bottom of the ACE methodology workscreen.

Time Phasing the Estimate

ACE contains several good methodologies

- Beta Curves
  - for development programs
  - see ESCP 173-2C
- the percentage of cost you would like to incur each Fiscal Year
- input quantities in terms of hardware end items
  - very important for full funding compliance

Inflate the Estimate

- ACEIT has multiple OSD inflation indices built-in to inflate the estimate to Then Year dollars - Defense Agencies, Army, Navy, Air Force, NASA, and the FAA.

- Indices unique to your Program can also be created and applied.

Document the Cost Estimate

- In ACE, you can edit the WBS definitions or enter your own.
- If you choose an estimating methodology from the ACEIT methodology library, the documentation to bring to your estimate is built right in.
- For equations you developed, ACE lets you document it “on-the-fly”.

Significant Time Savers and Quality Improvers

- ACE time phasing
- Calculate alternatives
- Document “as you go”
- Dynamic estimate
- Methodologies

ACE Executive

- Application that ties your ACE session to Excel.
- Allows an Excel worksheet or worksheets to be tailored for use by a “non-cost-analyst”.

Special “Watch Areas” in a Cost Estimate

Focus Areas of an Estimate

- Sufficient program definition
- Include all costs
- Ground-rules and assumptions
- Consistency
- Current estimate

Sufficient Program Definition

- Specify the estimating methodology only when you have sufficient program definition.

- Work with the functional specialists to define the program - the estimator must be a catalyst.

Include All Costs

Be Sure to Include:

- Non-deliverable hardware units
- Installation, checkout spares & test spares
- Hardware to software integration
- Prime loading on subcontracted/purchased equipment costs
- Interim contractor support requirements
- Non-contract costs

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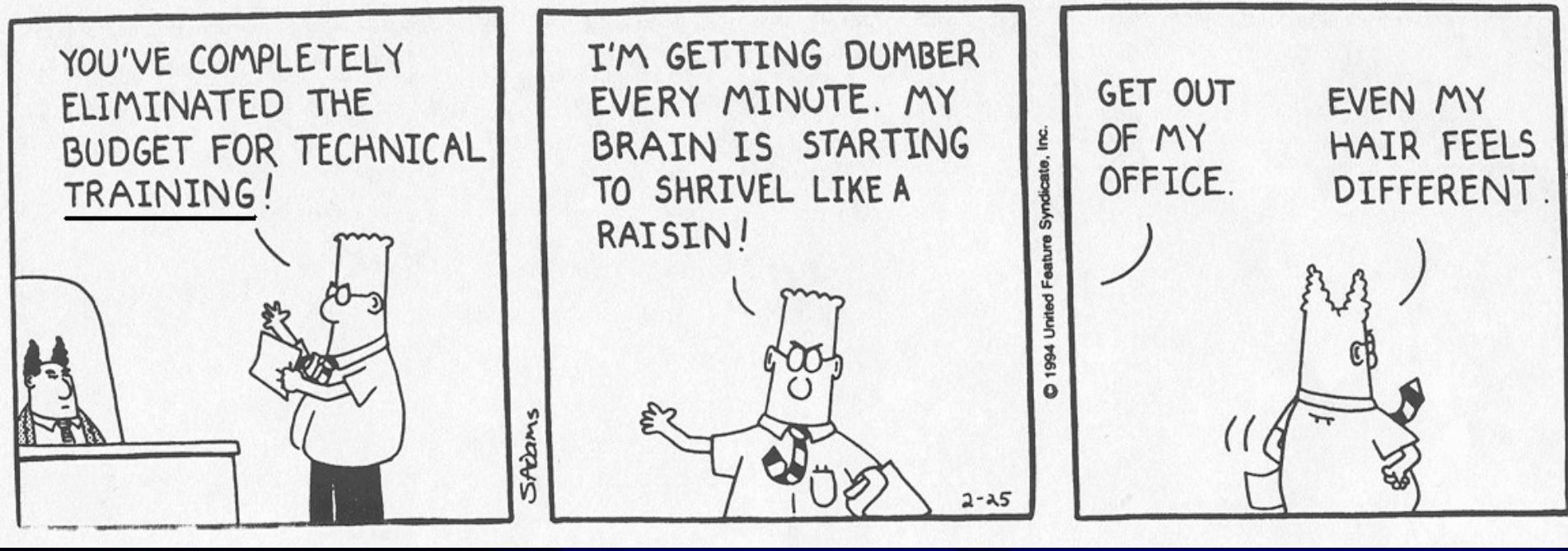
YOU'VE COMPLETELY ELIMINATED THE BUDGET FOR TECHNICAL TRAINING!
I'M GETTING DUMBER EVERY MINUTE. MY BRAIN IS STARTING TO SHRIVEL LIKE A RAISIN!
2-25
Adams
© 1994 United Feature Syndicate, Inc.
GET OUT OF MY OFFICE.
EVEN MY HAIR FEELS DIFFERENT.

Ground-rules and Assumptions

Examples of Unrealistic Ground-rules & Assumptions

- “Existing software with modifications will be used.”
- “There will be no new software developed.”
- “Most of the software will be commercial off-the-shelf (COTS).”

Run Sensitivities on Assumptions

Consistency

Areas to Look for Inconsistencies:

- Uncertainty in program definition
- Schedule changes
- Estimate phasing
  - Funds phased incorrectly
  - Phasing not consistent with the schedule
- Prime contractor loadings

Uncertainty in Program Definition

- When Program definition is uncertain, the cost associated with risk should be higher.
- Sensitivity analyses should be done to assess this inherent risk.

Schedule Changes

- Schedule changes (accelerated or stretched) usually impact cost.
- Schedule changes should be addressed in the estimate to avoid estimate inconsistencies.

Estimate Phasing

- Funds phased incorrectly
  - Full Funded or Incrementally Funded
- Phasing not consistent with the schedule

Prime Contractor Loadings

If the prime contractor is integrating the efforts of several subcontractors, there will be a significant amount of extra loadings added to the effort. Again, the typical extra loading factor experienced by ESC programs is 35% on each subcontract.

Consistency

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- Estimate phasing
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  - Phasing not consistent with the schedule
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Current Estimate

- Estimate should reflect the most current information
  - Technical Definition
  - Acquisition Process
  - Contractual Information

An estimate is not a one-time event. It must reflect current information.

Other Areas to Focus On

- Cost Drivers
- Trade-Offs
- Cost Estimate Structure
- Static vs. Dynamic Cost Estimate

Cost Drivers

- Program cost drivers need to be identified.
- It is a tremendous service for the Program Director and functional team when you point out which key issues or parameters drive the cost of the program.
- The functional specialists will monitor those issues or parameters throughout the program.

Trade-Offs

The results of your trade-offs can provide valuable information to decision-makers.

Use the Major Cost Drivers to establish what trade-offs to do.

Cost Estimate Structure

- structured by WBS
- structured according to the needs of the Program Manager
  - in terms of individual contracts,
  - in terms of contract line items OR
  - in terms of major ECOs

Static vs. Dynamic Cost Estimate

- a static estimate is one that may be useful at the moment, but the minute something in the Program changes, the estimate is useless
- a **dynamic** estimate is structured to be a useful tool for present and future decision-making
  - what things in the Program are most likely to change? - structure the estimate to give those things visibility
  - incorporate algorithms & automate the estimate

Integrity in the Estimating Process

- Be honest
- Be logical
- Substantiate
- Be humble

The Cost Estimating Process

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How Can You Tell If the Cost Estimating Process Is Healthy and the Estimate Is Good?

- Who is developing the estimate?
- Are the latest estimating tools being used?
- Is the estimate clearly substantiated?
- How good is the time phasing?
- Is the estimate dynamic?
- Is the estimate used in the PM's decisions?
- Does the estimate address all key issues?
- Is the estimate an integral part of the FM Process?

Who Is Developing the Estimate?

- The estimator’s experience and ability will have a big impact.
- Has the estimator been properly trained?
- Does the estimator understand the process?

Are the Latest Estimating Tools Being Used?

People who are accomplishing healthy estimates know the latest tools and methodologies available.

Is the Estimate Clearly Substantiated?

- Confidence check methodologies
- Substantiation
  - Proof
  - Logic

How Good Is the Time Phasing?

- What time phasing methodology was used?
- Is the time phasing methodology logical?
- Is the time phasing consistent with the schedule?
- Is it consistent with the contract quantities?

Is the Estimate Dynamic?

- A cost estimate is dynamic if it can quickly give cost information to the FM chief and PMs to answer the the questions they are asked most often.

- The cost estimate must support program management decision-making.

Is the Estimate Used in the Program Manager's Decisions?

- Sometimes an estimate is done only to "fill a square" and the PM does not use the estimate.
- If the PM is getting his estimates from another source, you do not have a healthy process.
- The cost estimate should be an integral part of the Program Management/decision-making process.

Does the Estimate Address All Key Issues?

- relevant trade-offs are examined
- cost drivers are highlighted
- sensitivity analyses are done to determine the impact of cost drivers and major assumptions

Is the Estimate an Integral Part of the Financial Management Process?

- If so, then the estimate is used in day to day decision-making, what-if drills, and to prepare budget submissions.

Example: If a budget cut drill comes in and the Program is faced with a 50% cut in a particular year, there should be a cost estimator on the team that puts the response together.

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What Makes One Estimate Better Than Another?

The best estimate is . . .

…sound, logical and substantiated.

…solid analysis that addresses all key issues.

…dynamically structured so that it can quickly respond to what-ifs.

…effectively structured for use by the PM and Financial Manager.